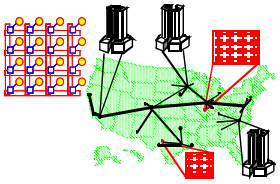
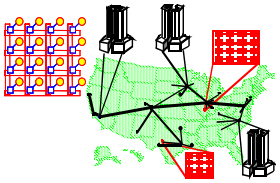


More *Flexible* Higher-Level *Mechanisms* for the Future

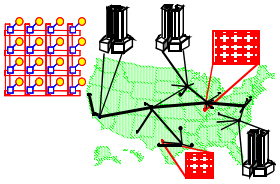
Jon, Jim, Larry, and Ruth

DOE National Collaboratories Meeting
ANL, August 10-12, 2004



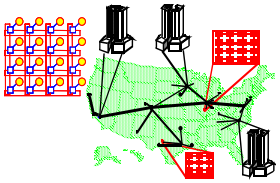
Introduction

- Goals of long-term research
  - increase functionality
  - reduce time to solution
  - promote collaboration
- Aspects of flexibility
  - mechanism can support different ways of providing a capability
    - multimodal interfaces
  - mechanism is applicable across multiple application domains
    - hydrogen, biosciences, …
  - mechanism can be customized
    - multiple granularities: service, workflow, environment
- Why flexibility?
  - science-driven exploration requires flexible mechanisms that can mitigate the complexity in information-intensive domains



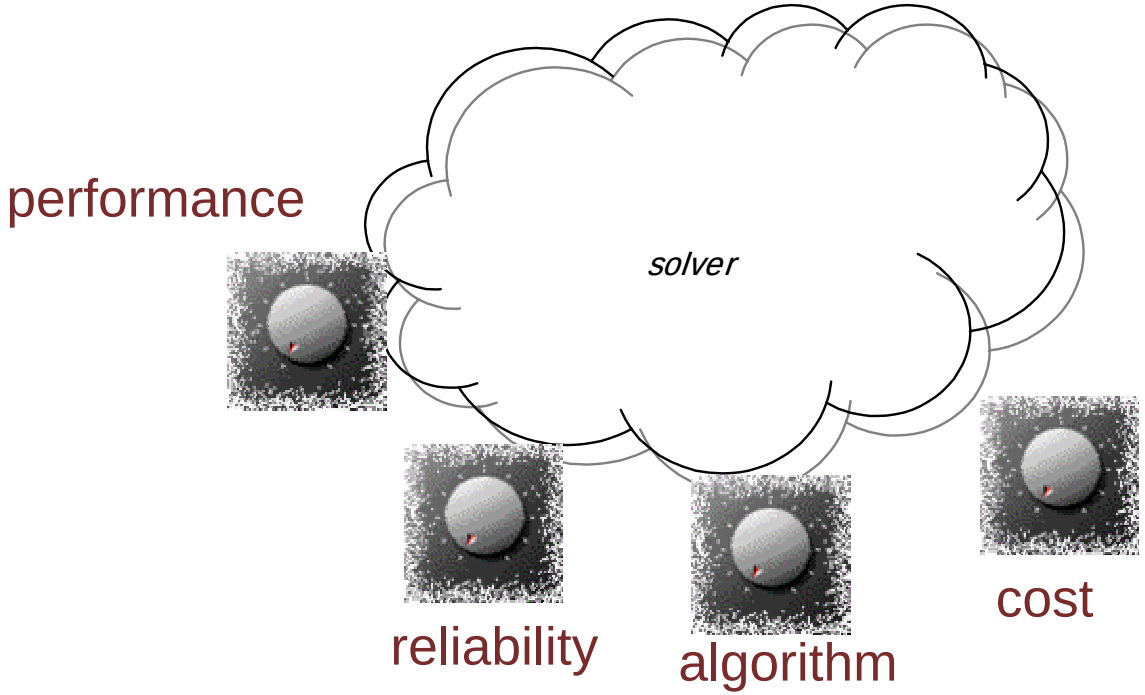
Idea 1

- Flexible Grid programming languages
  - “push down” higher-level concepts into a Grid PL
  - examples: semantics, flexibility, workflow, dependence, and policy
  - extensible languages may be useful here

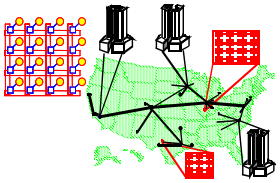


Idea 2

- Flexible Grid services



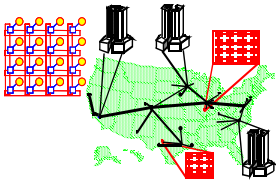
- Extended to service chains or workflow
- Decouple configuration from use



Idea 2 (cont'd)

- One step further …
  - extend service interface, plug in new capabilities
  - interface could evolve separately from implementation

- Flexible service evolution
  - expose capabilities as published services
  - scientific life-cycle
    - local use -> community use (portlet) -> wider use (Grid service) -> fully integrated



Idea 3

- Flexible data manipulation
- Knobs to extract metadata from raw scientific data to enable custom searches
  - ontological meta-data extraction
  - e.g. use OpenCYC database